

Diabetes is the seventh leading cause of death among Latinos.



# Diabetes

Healthy Lifestyles can delay and reduce the harm and onset of diabetes complications.



Office of Minority Health  
Responsible Center  
PO Box 1000  
Washington, DC 20001-1000  
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# Among

Signs and symptoms of diabetes are often subtle and go unnoticed for years.



# Latinos



IMH97D3035

## **The National Council of La Raza (NCLR)**

The National Council of La Raza (NCLR), the largest constituency-based Hispanic organization in the nation, exists to improve life opportunities for the more than 22 million Americans of Hispanic descent. A nonprofit, tax-exempt organization incorporated in Arizona in 1968, NCLR serves as an advocate for Hispanic Americans and as a national umbrella organization for more than 200 formal "affiliates," community-based organizations serving Hispanics in 37 states, Puerto Rico, and the District of Columbia. NCLR seeks to create opportunities and address problems of discrimination and poverty through four major types of initiatives:

- ❖ Capacity-building assistance to support and strengthen Hispanic community-based organizations;
- ❖ Applied research, public policy analysis, and advocacy on behalf of the entire Hispanic community, designed to influence public policies and programs so that they equitably address Hispanic needs;
- ❖ Public information efforts to provide accurate information and positive images of Hispanics in the mainstream and Hispanic media; and
- ❖ Special catalytic efforts which use the NCLR structure and reputation to create other entities or projects important to the Hispanic community, including international projects consistent with NCLR's mission.

NCLR is headquartered in Washington, D.C. and has program offices in Chicago, Illinois; Los Angeles, California; Phoenix, Arizona; and San Antonio, Texas.

# Diabetes Among Latinos

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# I. Introduction

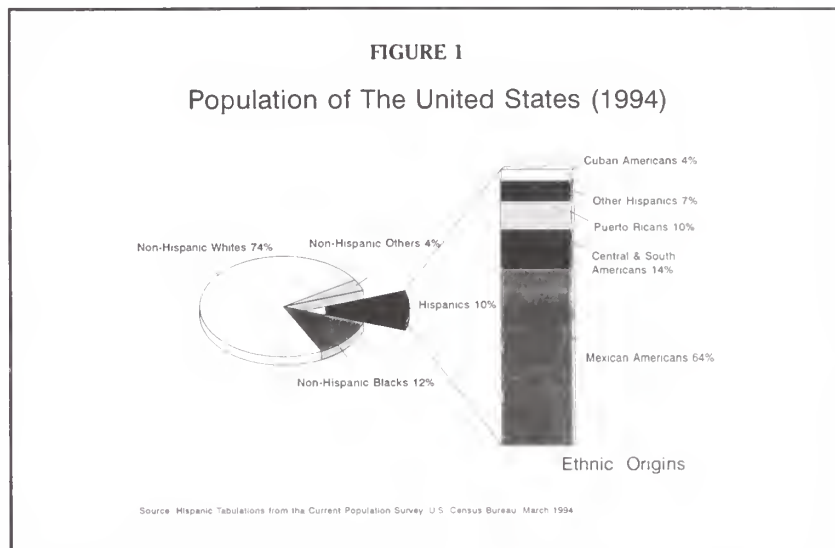
**Latinos\* make up 10% (27 million) of the U.S. population, representing the second largest minority group in the U.S.; it is projected that by the year 2000, Hispanics will be the largest minority group.** This rapid growth in the U.S. Hispanic population underscores the need to address the health issues that affect them. While the total U.S. population only grew by 6% from 1990 to 1994, the Hispanic population experienced an increase of 28% during this same period. Hispanics constitute a young population with a median age of 26 compared with 34 for the general population. Hispanics are diverse in their ethnic and racial backgrounds (see Figure 1).<sup>1</sup>

**Diabetes mellitus (DM) is a group of disorders in carbohydrate metabolism, characterized by elevated levels of glucose in the blood (hyperglycemia), resulting from impaired secretion of insulin by the pancreas or increased resistance (decreased response) to insulin.** The typical signs and symptoms of DM are rapid weight loss, abnormal elevation of blood glucose, frequent urination (polyuria), frequent thirst (polydipsia), and frequent hunger (polyphagia). Unfortunately, many people who have diabetes do not experience these symptoms. As a result, the disease can go unnoticed and untreated for many years, causing significant organ damage.

The purpose of this information guide is to summarize some of the major sources of information on diabetes among Hispanics in order to stimulate the implementation of programs to reduce the burden of diabetes among Hispanics at the national, regional, and local levels. In addition, this guide will reveal the need for additional research in diabetes and Hispanic subgroups. It will also serve as a resource for community-based organizations and other individuals interested in Hispanic health.

To accomplish this purpose, this guide will explain the incidence and prevalence of diabetes among both Latinos and the general population. The diabetes risk factors in Hispanics will also be described. A general overview of the classifications of diabetes, including insulin and non-insulin dependent diabetes (IDDM and NIDDM), and their various complications will be summarized and finally recommendations for prevention and research will be suggested, with special consideration for the barriers to health care services experienced by many Hispanics.

\* The terms "Latino" and "Hispanic" are used interchangeably in this report



## II. Background

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**Diabetes is the seventh leading cause of death among Latinos.** There are approximately 16 million people with diabetes, both diagnosed and undiagnosed, in the U.S.<sup>2</sup> Of this number, 7.8 million (3.1% of the U.S. population) have been diagnosed with the disease. About 19% of these cases affected persons less than 45 years of age, 38% in those between 45-64 years old, 26% in those between 64-74, and 17% in those 75 years of age and older.<sup>3</sup> While mortality rates due to diabetes in the U.S. have decreased since the 1970's, over 250,000 people still die each year from causes directly related to diabetes<sup>4,5</sup>. As a result, the economic impact of diabetes is great (see Figure 2).

**The estimated prevalence of insulin-dependent diabetes mellitus (IDDM) in the U.S. ranges from 300,000 (1.2 per 1000) to as high as half a million individuals, of whom 120,000 are less than 20 years of age (1.7 per 1000).<sup>6</sup>**

IDDM is one of the more prevalent chronic diseases in children. There are approximately 30,000 new cases of this form of diabetes mellitus each year, of which half are less than 20 years of age.<sup>7</sup>

**Non-Insulin dependent diabetes mellitus (NIDDM) is a more common form of diabetes, comprising 90% of all diabetes cases.** Approximately 625,000 new cases per year were diagnosed in 1990-1992.<sup>2,5</sup> NIDDM generally develops in adults over the age of 45. It is more prevalent in minority groups, specifically in African Americans, Puerto Ricans, Mexican Americans, and Native Americans. Of all those diagnosed with diabetes between 1990-1992, 58% were women.

Diabetes and its complications have a high mortality rate. On the basis of death certificate data, diabetes contributed to more than 169,000 deaths in 1992. Given that diabetes is underreported on death certificates, the actual number of deaths may be much higher.<sup>2</sup>

FIGURE 2

### THE ECONOMIC IMPACT OF DIABETES

- ⇒ 16 million Americans have diabetes.
- ⇒ \$102.5 Billion (one seventh of \$720.5 billion spent in health care), is spent in the care of diabetics.
- ⇒ The annual cost per each diabetic is \$9,500 compared to \$2,600 for those without diabetes.

*Source: Patient Care, Feb., 1995, 29(3):10-11.*

### III. Incidence and Prevalence of Diabetes Among Latinos

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**Diabetes is the fourth leading cause of death among Latinos 65 years of age or older, and the sixth leading cause of death among non-Hispanic whites of the same age group.<sup>8</sup>** Higher mortality rates in the Latino community can be attributed to lack of access to health education and services. Although Latinos may be aware of the high rates of diabetes among their families and in their communities, many Latinos remain undiagnosed and therefore unaware of their own disease. In addition, the signs and symptoms of this disease and its complications are often subtle and go unnoticed in the earlier stages. Finally, many Latinos are not aware of the significant and long-term complications, including early death, that result from uncontrolled diabetes.

**The prevalence (the rate of current cases over time) of diabetes is two to four times higher in Mexican Americans and Puerto Ricans aged 45-74 than in non-Hispanic Whites of the same age group.<sup>9,10</sup>** The prevalence of diagnosed and undiagnosed diabetes among other Hispanic subgroups has not been as documented as it has been among Mexican Americans. One report based on the two national surveys, the National Health and Nutrition Examination Survey II (NHANES II) and the Hispanic Health and Nutrition Examination Survey (HHANES), describes the age-standardized rates of both diagnosed and undiagnosed diabetes for Latinos of different subgroups and then compares them to that of the non-Hispanic Whites and non-Hispanic Blacks. This study showed that the prevalence of diabetes is 13% in Mexican Americans, 13.4% in Puerto Ricans from the mainland, and 9.3% in Cuban Americans, compared with 6.2% in non-Hispanic Whites and 10.2% in African Americans.<sup>11</sup>

**Most of the information on Latinos and diabetes comes from studies done with Mexican Americans from the Southwest. These studies, along with the HHANES and the Puerto Rico Household Survey, serve as major sources of information about Latinos and diabetes.** Of these studies, HHANES is the only one that provides information on Puerto Ricans and Cubans in the mainland of the U.S. Other studies on Latinos and diabetes include:

**The Laredo, Texas Study:** This study conducted in 1979 was one of the first studies of glucose intolerance in Mexican Americans. Fasting blood samples were used in this population-based, random sample study of 389 Mexican Americans, age 40-74. The results showed that approximately 16% of men and women had a history of diabetes and were either being treated for the disease or had a fasting plasma glucose that indicated the presence of diabetes. This study only represented the rates of "severe" diabetes, since an oral glucose tolerance test (OGTT) was not performed.<sup>12</sup>

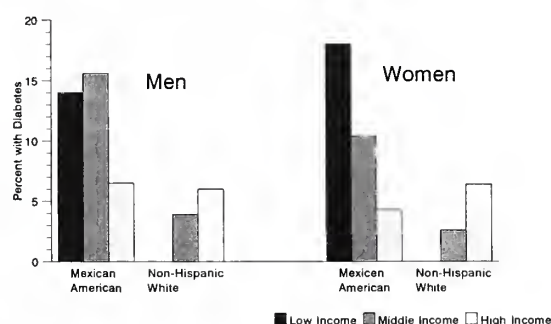
**The San Antonio Heart Study:** This two-phase study carried out in 1979-1982 and in 1984-1988 was the first population-based study of Latinos in which a full OGTT was administered to each participant. A total of 3,302 Mexican Americans and 1,877 non-Hispanic Whites, age 25-64, were sampled from three different socioeconomic neighborhoods (low, transitional, and high-income suburbs). The study found that as economic status

increased, the prevalence rates of diabetes decreased. Prevalence of NIDDM was two-to four-times higher in Mexican Americans from low-income neighborhoods compared with those from high-income suburbs. Furthermore, the age-adjusted prevalence for Mexican American men was twice as high in the low-income group compared with that of the high-income group (14% versus 6.5%). For women, the disparity was even greater. Low-income women exhibited a diabetes prevalence rate of 18% versus 4.3% for those in the higher-income neighborhoods (see Figure 3). Mexican Americans and non-Hispanic Whites in the higher-income suburban neighborhoods had similar rates of NIDDM; however, in the transitional-income neighborhoods, the prevalence of NIDDM in Mexican Americans was quadrupled.<sup>13</sup>

**The HHANES Study:** This cross-sectional study is the most comprehensive study of the health status of U.S. mainland Latinos. The Hispanic subgroups included in this 1982-1984 study were Mexican Americans, mainland Puerto Ricans, and Cuban Americans. A history interview and an oral glucose tolerance test (OGTT) were done as part of this study.

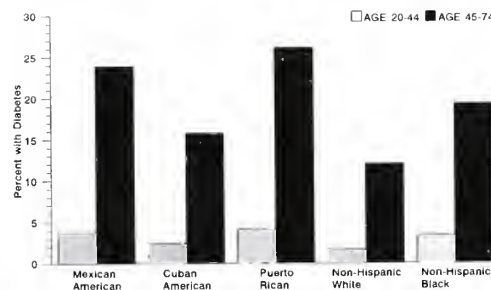
The HHANES survey found that the prevalence rates of diabetes among both men and women 45-74 years of age was two- to three-times greater for both Mexican Americans (23.9%) and Puerto Ricans (26.1%), compared to Cuban Americans (15.8%) and non-Hispanic Whites (12%). Among younger people (age 20-44), only 3.8% of Mexican

**FIGURE 3**  
Age-Adjusted Prevalence of NIDDM  
In Mexican Americans and Non-Hispanic Whites by Income  
San Antonio, Texas, 1979-88



Source: San Antonio Heart Study

**FIGURE 4**  
Total Prevalence of Diabetes by Age and Ethnic Group  
HHANES 1982-1984 and NHANESII 1976-1980



Source: Diabetes Care Vol. 14, No. 7, Suppl. 3, July 1991



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Americans, 4.1% of Puerto Ricans, and 2.4% of Cuban Americans were found to have diabetes.<sup>14</sup> (See Figure 4).

**San Luis Valley, Colorado Study:** This 1984 and 1986 study, conducted in two poor, bi-ethnic, and rural counties, included all persons with previously diagnosed diabetes and a random sample of 607 individuals with no prior history of diabetes. Participants received a medical examination and an OGTT. The prevalence rates of previously diagnosed NIDDM in San Luis Valley for those participants 20 years and older were 2.9% in Hispanic men and 4.7% in Hispanic women. These rates of diagnosed NIDDM were 1.8-fold and 4.1-fold higher, respectively, than those of previously diagnosed NIDDM in non-Hispanic White males and females of the same age group. In addition, 4.5% of Hispanic men and 8.4% of Hispanic women were newly diagnosed with diabetes; these rates were also higher than those in non-Hispanic Whites.<sup>15</sup>

**Albuquerque, New Mexico Study:** This was a population-based health survey of 1,175 Hispanic residents of Albuquerque. In this study, the self-reported prevalence of diabetes was found to increase with age; 13.8% of the men and 16.1% of the women aged 75 and over reported having diabetes.<sup>16</sup>

**The Puerto Rico Household Health Interview Survey:** This survey showed an increase in incidence of diabetes from 3.1% in 1975 to 5.1% in 1985. The prevalence of diabetes in Puerto Ricans obtained through this study revealed that 4.5% of males and 5.8% of females suffered from diabetes. These rates of diabetes are not unlike those reported for Puerto Ricans in the HHANES survey.<sup>17</sup>

**There is very little data available on the incidence (the rate of new cases at a specific point in time) of NIDDM among Latinos. Much of what is known comes from the San Antonio Heart Study and the San Luis Valley Study.** The San Antonio study of Mexican Americans in three different neighborhoods found an eight-year NIDDM incidence of 8.7% in the low-income neighborhoods; 8.4% (compared with 5.6% of non-Hispanic Whites) in transitional neighborhoods; and 3.4% (compared with 2.2% of non-Hispanic Whites) in the high-income suburbs.<sup>18</sup> The 1983-1988 San Luis Valley, Colorado study of the incidence of diabetes in Latinos, using the OGTT for verification of diabetes, demonstrated an age-specific annual average incidence rate of 4.3 per thousand in men and 5.3 per thousand in women. These rates were 2.4 times higher for Hispanic men and 3.6 times higher for Hispanic women compared with their non-Hispanic White counterparts.<sup>19</sup>

## IV. Older Latinos and Diabetes

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**In the Hispanic population, 33.3% of people 65-74 years of age, have diabetes, compared to 17% in non-Hispanic Whites of the same age group.** The HHANES study showed that half of the Mexican American population, over the age of 55, have diabetes or impaired glucose tolerance, an important indicator for the risk of developing diabetes.<sup>20</sup> Despite their lack of access to health care, inadequate health care, and unhealthy lifestyles, Latinos are experiencing an increase in life expectancy. Since age has a confounding effect on diabetes onset and since the population of older Latinos is growing, the development of diabetes and its complications is a significant issue for public health.

## V. Hispanic Women and Diabetes

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**The leading causes of death among Hispanic women in the U.S. are heart disease, diabetes, breast and lung cancer.** The prevalence of NIDDM, or Type II diabetes, in Latinos is twice that of the general population. Within those elevated rates, Mexican American women have shown only slightly higher rates of diabetes than have Hispanic men.<sup>21</sup> However, there is still very little data about diabetes in Hispanic women, in general, as well as in women of Hispanic subgroups.

**Obesity and lack of exercise are important risk factors for the high prevalence of diabetes in Hispanic women.** Among Mexican Americans, 39% of women are overweight compared to 30% of men; in Puerto Ricans the rates are 37% for women and 25% for men; and in Cuban Americans, 34% for women and 29% for men.<sup>22</sup>

**Gestational Diabetes Mellitus (GDM) is also an important risk factor for NIDDM. Mexican American women have high rates of gestational diabetes, which not only increases their risk for perinatal, maternal, and infant complications, but also places them at higher risk for developing diabetes later in life.** This emphasizes the need to closely monitor Hispanic women with a history of GDM in order to prevent or detect the onset of NIDDM at an early stage. The aim is to prevent the complications of diabetes.<sup>23</sup>

Obesity, sedentary lifestyles, and gestational diabetes, compounded by the general burden of poverty, inadequate education and access to health care, places Hispanic women at a high risk for diabetes and its many complications, including cardiovascular and kidney disease. Most of the data available on risk factors come from studies done on Mexican American women. Additional research must be done to address the risk factors that specifically pertain to women of different Hispanic subgroups. Presently, there is minimal data on minority women and diabetes.

## VI. Diabetes Risk Factors Among Latinos

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The risk factors for the development of IDDM are not well known. However, there are theories of environmental, hereditary, and viral etiology. Studies on the etiology of IDDM address the effect of each of these factors on this chronic disease. For NIDDM, aside from genetics, there are known risk factors that lend to prevention strategies (See Figure 5). The following life style and socioeconomic risk factors are the main contributors to the development of NIDDM, presenting a challenge at both the individual and national levels.

**Obesity:** Obesity has been shown to be an important risk factor for the development of NIDDM. Excess adiposity in the body contribute to the exhaustion of the insulin-producing pancreatic cells, as well as to the body's resistance to insulin. Unfortunately, obesity is highly prevalent in the Hispanic community, particularly in women. Studies of Mexican Americans, Cuban Americans, and Puerto Ricans further show high prevalence rates of obesity among the Hispanic community, in general.<sup>21 23</sup>



**Lack of exercise:** A sedentary life style is a significant risk factor for NIDDM because lack of exercise not only has a direct negative influence in the metabolism of insulin and carbohydrates, but also has a direct impact on the development and persistence of obesity.

**Genetic factors:** Genetic factors, such as the admixture of American Indian ancestry, may place Mexican Americans, Puerto Ricans, Cuban Americans, and South and Central Americans at a higher risk for developing NIDDM.<sup>21</sup> However, this does not completely explain the prevalence of diabetes among other Hispanic groups. Some hypothesize that African black admixture may contribute to a higher risk as well. Since many Hispanic subgroup populations, such as Puerto Ricans, have African black ancestry, one may conclude that African admixture contributes to increased risk for NIDDM among Puerto Ricans.<sup>17</sup> These and other genetic associations are still under study.<sup>24</sup>

**Socioeconomic factors:** The role that acculturation - related to diet and lifestyle - has in the development of NIDDM has been studied with variable results. Some studies show

FIGURE 5

### DIABETES RISK FACTORS:

- ⇒ Obesity
- ⇒ Family history of diabetes
- ⇒ Older age
- ⇒ Latino, African Black or American Indian origin
- ⇒ Sedentary life
- ⇒ Diet high in fat/sugar calorie diet



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that increased acculturation played a greater role in the development of NIDDM in Mexican American women than in men. Other studies, such as the HHANES, have shown a lack of association between acculturation and NIDDM. Studies attempting to find a relationship between level of education and NIDDM have also yielded inconclusive results.

**Diet:** A diet high in saturated fat, especially when the caloric intake is greater than the caloric output, can lead to the occurrence of NIDDM, as well as to obesity and cardiovascular disease. This risk factor is present in all Hispanic subgroups. Extensive research on Mexican Americans and diet show a correlation between the presence of this risk factor and the development of NIDDM.

There is also evidence that Latinos, particularly Mexican Americans, have other metabolic characteristics that make them more susceptible to NIDDM. For example, they display some degree of resistance to the normal action of insulin in the body, which can manifest as high levels of insulin (hyperinsulinemia). This, along with increased levels of fats (hyperlipidemia), and high blood pressure, will result in significant increases in the morbidity of NIDDM.



## VII. Diabetes

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### A. Classifications of Diabetes

There are four main types of diabetes (see Figure 6). Of these, the two most common among Latinos are Non-insulin Dependent and Gestational Diabetes.

#### **Diabetes Type I, Insulin Dependent Diabetes Mellitus (IDDM)**

This type of diabetes is characterized by elevated blood sugar with little or no insulin secretion; therefore, the usual signs, symptoms, and acute complications of diabetes develop earlier and are frequently more dramatic, often requiring hospitalization. These individuals require insulin replacement in the early stages of their condition. The peak age for IDDM is between 11 and 13 years, but it can develop at any age. The cause of IDDM has not been determined. Some theories include genetic predisposition; viral infections that may affect the pancreatic insulin-producing Beta cells; and autoimmune damage to the Beta cells, which may also explain why there is higher incidence of diabetes in individuals with certain genes that control the immune response.

**FIGURE 6**

#### **DIABETES MELLITUS:**

Four main types

- ⇒ Type I, insulin dependent diabetes mellitus (IDDM)
- ⇒ Type II, non-insulin dependent diabetes mellitus (NIDDM)
- ⇒ Gestational diabetes mellitus (GDM)
- ⇒ Diabetes secondary to other causes

#### **Diabetes Type II, Non-Insulin Dependent Diabetes Mellitus (NIDDM)**

**This type of diabetes, the most common type among Latinos and the general population, results from both an impaired response to blood glucose and a decreased insulin effectiveness.** The onset of NIDDM is usually after age 30. The majority of those who develop NIDDM are overweight adults. Many people are unaware that they have NIDDM because of the initial subtlety of its symptoms. Unfortunately, many individuals seek medical attention only after they have developed some of the complications.

In NIDDM, the individual has high blood glucose, but insulin deficiency is not as significant a problem as it is with IDDM. These diabetic individuals have a resistance to the action of insulin due to decreased binding at the insulin receptor sites in many organs of the body and other factors. Therefore, the significant elevation of blood sugar is due to not only a decrease in insulin production, but also a decrease in insulin action.

Some of the serious acute complications of IDDM, do not occur in NIDDM except in the presence of some other serious acute illness. People with NIDDM can later develop

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insulin requirements similar to those of IDDM, or they may become intermittently insulin dependent.

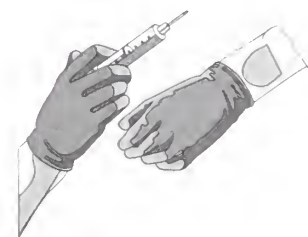
## **Gestational Diabetes (GDM)**

**GDM onset during pregnancy affects 2% - 5% of all pregnancies. Hispanic women have a higher prevalence of GDM. One study showed a GDM rate of 6.3% in Hispanic women versus 4.9% in non-Hispanic White women.<sup>25</sup>** Some studies have shown even greater rates of prevalence of GDM both in the general population and among Latinos. This wide range in results is due in part to the different diagnostic and screening methods used in the various studies. GDM is usually detected during prenatal examinations. Early detection and control of GDM during pregnancy prevents serious and possibly fatal complications to the mother, the fetus, and the newborn. Although some studies question the need for GDM screening, most pregnant women undergo a glucose tolerance test.<sup>26</sup> If they are found to have GDM, closer medical supervision and attention to glucose levels, diet, exercise, and weight gain is recommended in order to prevent the complications of GDM. Because it is known that many Latino women may not seek prenatal care, it is imperative that there be more community-based education about GDM.

## **Secondary Diabetes**

Diabetes secondary to other conditions may be due to infections or trauma to the pancreas or other endocrine glands. Diabetes may also be precipitated by certain medications, such as steroids or beta-blocking medications.

## **B. Screening Tests**



**Diabetes is often a silent disease; up to 50% of people with NIDDM are undiagnosed and suffer from some of the complications of diabetes.** Screening high-risk groups, like Latinos and African Americans, is important. Many of the serious complications of diabetes can be avoided if diabetes is both identified and controlled.

**The effectiveness of the various screening methods (determined by their specificity and sensitivity) for large scale testing are a matter of debate.** The oral glucose tolerance test (OGTT) is considered the best screening test because of its high accuracy in distinguishing diabetics from non-diabetics. However, the OGTT is very difficult and expensive to administer. OGTT requires the patient to take a glucose solution, followed by a series of blood samples, which are taken over a two-hour period.

**The fasting plasma glucose (FPG) test is commonly utilized in clinical settings.** The disadvantage to using the FPG test is that glucose levels must be measured after an

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overnight fast, on two separate occasions.<sup>27</sup> If diabetes is suspected but not confirmed by an FPG test, then an OGTT is done.

In contrast to the OGTT, the FPG test is easier to administer. Because large-scale screening is normally done in one day and the FPG requires two separate occasions, the FPG is less sensitive as a screening method and results in a failure to diagnose many people with NIDDM. Therefore, some suggest that the most cost-efficient method of screening would be to administer the OGTT to an identified high-risk population.

Other glucose screening tests include one in which blood is taken from a finger prick and measured for glucose levels with a portable electronic glucose monitor or with a color-graduated film strip. In addition, urine samples can be tested for glucose. Although these tests are frequently used for screening, they are less accurate because of a lack of standardization. For this reason, it is not recommended that these tests be used for screening purposes.

## **C. Complications**

Acute complications of diabetes are usually associated with IDDM. The more common are diabetic ketoacidosis (DKA), non-ketotic hyperglycemic-hyperosmolar coma (NKHHC), and hypoglycemia (low sugar levels in the blood). The long-term complications of diabetes, however, are perhaps the most important because they begin without symptoms yet involve vital organs. Obviously, this can lead to disability and often result in premature death.

### **Acute Complications**

Acute complications are serious conditions requiring immediate medical attention. Diabetic ketoacidosis (DKA) is a common and severe complication of the young IDDM patient. This medical emergency results from a severe metabolic imbalance in blood sugar levels, that can lead to a state of confusion, coma, or death. Unfortunately, this may be the first sign for an undiagnosed IDDM patient.

A second acute complication, hyperosmolar non-ketotic coma (HNC), occurs mostly in individuals with NIDDM. Conditions for this complication include very high levels of glucose in the blood, great losses of bodily fluids, and a sleepy, confused, or comatose state. Their blood glucose (normal 60 to 110 mg/dl) is markedly elevated (600 to 2000 mg/dl).

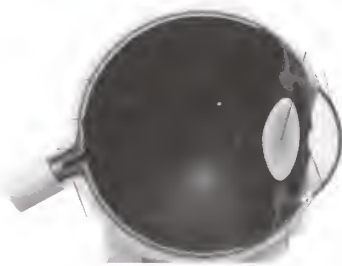
Hypoglycemia (low blood sugar) is also a serious acute complication often seen in both IDDM and NIDDM individuals as a result of an excess insulin dosage, a high dosage of oral diabetic medications, or other factors that may lower their usual insulin requirements. Symptoms of hypoglycemia may be nervousness, confusion, coma, and seizures.

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## Chronic Complications

Chronic complications affect a large number of diabetic individuals. These complications are the main causes of disability and death from diabetes.

### Eye Disease



**Diabetic retinopathy is the leading cause of new cases of blindness in the U.S. among people 20-74 years old, affecting as many as 97% of IDDM patients and 55% of NIDDM patients.** Diabetic retinopathy results from damage to the blood vessels in the vicinity of the retina in the eye. Retinopathy is more common among Mexican Americans than among non-Hispanic Whites. Some studies have found the prevalence to be two- to three-fold higher among this group of Latinos than in non-Hispanic Whites.<sup>28</sup> Other studies, such as the San Luis Valley, Colorado study, have shown the opposite to be true.<sup>3</sup>

These different results may be explained by differences in glycemia levels or rates of retinopathy in the non-Latinos that participated in some studies. Nevertheless, diabetic retinopathy is a significant problem in the Hispanic population, given the considerable problems of access to care and prevention.

**The damage and progression of diabetic retinopathy can be prevented by early diagnosis of diabetes, eye examination and strict control of glucose levels. The use of laser therapy has proven to be successful in preventing or slowing down damage to the retina.** These treatment and prevention steps can significantly reduce one of the main causes for blindness in the U.S.<sup>29</sup>

Other significant causes of impaired or lost vision in the diabetic individual include cataracts, glaucoma, and damage to the cornea; all of these will result in a loss of vision if not treated early. These complications are frequently encountered in the older diabetic individual.

### Kidney Diseases

**Nephropathy and end stage renal disease (ESRD) are common complications of diabetes that affect the kidneys. One-third of all new cases of ESRD, a severe form of chronic renal (kidney) failure, are caused by diabetes.<sup>30</sup>** Latinos with NIDDM are at a greater risk of ESRD than are non-Hispanic Whites.<sup>3</sup> Survival rates of Latinos with ESRD have been shown to be higher than in the general population, despite studies that show that Mexican Americans who sought dialysis treatment for ESRD have had greater severity of

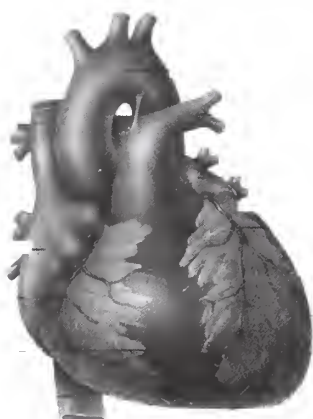




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kidney disease and other complications.<sup>3</sup> ESRD has no treatment except for dialysis (the cleaning of blood wastes) and kidney transplant. Other factors that contribute to the morbidity of this complication are hypertension and cigarette smoking, risk factors common in the Latino population.

### Cardiovascular Diseases



**Cardiovascular diseases, including coronary vascular disease and stroke, are more prevalent in the diabetic individual. The most common cause of death among those with diabetes is coronary heart disease.<sup>27</sup>** There is a two-to-three times greater risk of stroke and cerebrovascular disease in the diabetic individual compared to those without the disease.<sup>31</sup>

Although studies have shown an increased prevalence of myocardial infarction (heart attacks) among both Latinos and non-Hispanic diabetics, the Hispanic population, in general, have been found to have a lower prevalence of myocardial infarctions.<sup>31</sup> However, the risks for both strokes and myocardial infarcts are significantly compounded when hypertension, hyperlipidemia (elevated levels of fatty substance in the blood), and/or cigarette smoking are present, all of which are highly prevalent in the Hispanic community.

### Nervous System Damage

**Neuropathy, an inflammation and subsequent degeneration of the peripheral nerves is a common complication of both forms of diabetes (NIDDM and IDDM), affecting up to 70% of all diabetic individuals.** Peripheral nerves are those that are outside the brain and the spinal cord and are most often responsible for the actual responses to sensations. The damage to these nerves can cause significant problems, such as pain and burning sensations in the feet and legs of the diabetic individual, paralysis, skin ulcers, sexual dysfunction, gastrointestinal (stomach and intestines) dysfunction, abnormal heart beats, and many other serious complications. Latinos with diabetes do not appear to have a higher prevalence of neuropathy than non-Hispanic Whites.<sup>3</sup>

### Blood Vessel Damage

The lower extremities is often affected by damaged blood vessels and the resulting decrease in arterial blood flow. These changes are manifested by diminished or absent lower extremity pulses and pain in the calf muscles. Vascular (blood vessel) changes and sensory (nerve) deficits that are due to diabetic neuropathy eventually lead to ulcerations in the lower extremities. These lesions and ulcerations may develop gangrene and result in the amputation of the toes or feet, commonly seen in diabetic patients.<sup>33</sup>

## VIII. Diabetes Management

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Diabetes causes damage to many other organ systems. Diabetic individuals suffer from digestive diseases that may cause diarrhea or constipation, abdominal pain, and other digestive disorders. Infections affecting the skin, such as cellulitis, may progress and lead to amputations. Other infections such as pneumonia, urinary tract infections, and infections in the bone are more prevalent and more difficult to treat in the diabetic individual. Diabetes also affects the mouth. The prevalence of gingivitis and periodontal disease is high in individuals with IDDM.

The diabetic individual will need to establish major life style changes. Many will require a lifetime of medications and medical care. Therefore, developing a cooperative relationship with the health care professional and establishing personal responsibility are of great importance, if diabetes is to be controlled effectively.<sup>34</sup> Once identified, a diabetic patient should undergo a thorough physical examination, including laboratory tests to identify any coexisting diseases or complications resulting from diabetes. The health care provider must establish an individualized diabetes management program with the patient. In doing so, providers must become familiar with the patient's life style, culture, education, and socioeconomic status to reach the appropriate level of communication required of a patient/provider team. Communication is essential to this relationship, especially in achieving effective treatment. In addition, a patient's personal involvement contributes to more control over the disease.

### Education

**Patient education allows patients to become active participants in the management of their diabetes. This must take place within the cultural, educational and socioeconomic context of the patients.** The level of formal education and the degree of acculturation to "American" society often determine how fluent Latinos are in the English language. In order to reduce the risk and severity of diabetes complications, each diabetic person must learn the importance of diabetes control. Knowledge and understanding of the disease are key to increasing patient compliance, ultimately achieving success in controlling diabetes. Therefore, it is important that health care providers consider any barriers that may affect a patient's ability to comprehend, including language barriers as well as literacy levels when providing services. Health care providers should identify culturally-based diabetes educational resources and refer the diabetic patient to these services.

Self-monitoring of blood sugar is an important component of diabetes management. Inexpensive electronic blood glucose monitoring kits are now available for patients to use in controlling their diabetes. The regularity with which this home glucose monitoring is used depends on the type of diabetes and the type of medications that are prescribed.

The educational process should take place gradually over a number of visits. This allows for frequent reinforcement of the basic messages, minimizing the use of medical jargon that the patient may not understand. This educational process need not be the

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responsibility of the physician. A qualified nurse, trained nutritionist, or diabetic educator in a community-based health center, accepted by the patient, can establish a long-lasting relationship with his/her patient.

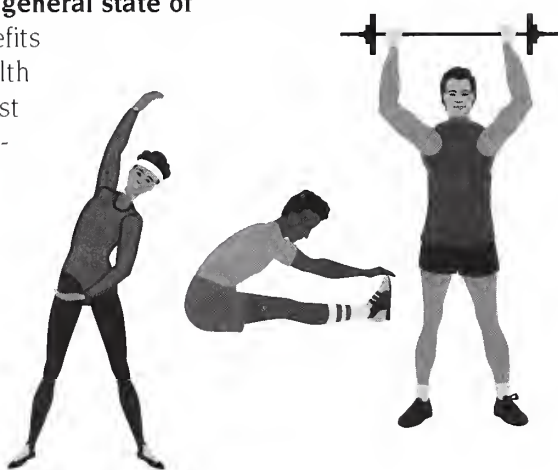
## Diet

The importance proper nutrition has in the control of diabetes must be promoted with sensitivity to the special dietary customs of the various Hispanic subgroups. Not only the patient, but the whole family must be involved in this learning process. The standard diabetic nutritional guidelines must be individualized and tailored to the foods consumed by the Hispanic individual.<sup>35</sup> The ideal is to keep near normal serum glucose and lipid levels and promote weight loss in the overweight with careful attention to adequate caloric intake. Individuals should be counseled about the significant risk of alcohol consumption. For Latinos of various subgroups their beliefs and concepts about body size must be explored since these may affect their attitude toward weight loss.<sup>36</sup> Dietary counseling may be reinforced with reading materials appropriate for the literacy level and language comprehension of the diabetic individual, and be part of a continuing learning process. Dietary habits are deeply rooted in a cultural and socioeconomic background, close cooperation and understanding between the diabetic patient and the health provider is necessary.<sup>37</sup>

## Exercise

**Latinos with diabetes like most NIDDM patients tend to be sedentary and overweight. Exercise is an important component of diabetes management; and it must be tailored to the individual general state of health.**<sup>38</sup> Individual beliefs about the benefits of exercise for diabetes control, and for health in general should be sought in order to assist the diabetic individual in overcoming barriers to successful behavior modification. There are other barriers to physical activity which need to be addressed; for example, some Latinos live in unsafe neighborhoods where walking is risky.

The types and variety of exercise must be explained with emphasis that walking is a good exercise. For walking or any other exercise to be effective, it must be regular. Recommendations include walking for thirty-minute sessions, four-to-five-days per week. The intensity should be tailored according to the patients' needs and their cardiovascular and physi-





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cal capacity. For weight loss purposes a more intense routine may be needed. However, patients who use various medications should take precautions and seek medical advice before beginning such a program.

## Oral Medications

Sulfonylureas (ie. glyburide, glipizide) are oral medications used mainly by NIDDM patients if diet and exercise alone have failed to control the diabetes. These medications aid in the management of diabetes, but in no way substitute exercise and a well balanced diet.



New oral medications for treatment of diabetes were introduced by the FDA in 1995. One of them includes Metformin (Glucophage) for NIDDM that decreases glucose production in the liver and increases glucose uptake. Metformin does not have an effect on the pancreas, and does not work well in the absence of insulin. It may have unpleasant gastrointestinal side effects and it is expensive.<sup>39</sup> Another newly introduced medication is Acarbose (Precose), which works by interfering with the absorption of

glucose in the intestinal tract. This medication may also be used with sulfonylureas and insulin. Unfortunately it is also an expensive medication and may have some unpleasant side effects.<sup>40</sup>

## Insulin

This is primarily used by IDDM patients, however, many NIDDM patients may end up using insulin. This can be a life-saving medication for many patients, but it also requires greater attention to patient education for its proper use.

The Diabetes Control and Complications Trial (DCCT) has set the tone for the appropriate medical treatment of IDDM in order to avoid complications. This research group recommended intensive therapy to bring about significant reduction in retinopathy, nephropathy, and neuropathy. They concluded that diet, exercise, and an intensive program of variable insulin dosing could reduce morbidity of diabetic patients.<sup>41</sup> Some practitioners believe that NIDDM patients will also benefit from a similar approach.

## IX. Prevention Strategies

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Prevention programs for the Hispanic community should be carefully designed and should take into account literacy level, language, and cultural factors. The goal of primary prevention programs should be to address all the possible risk factors for diabetes, in order to prevent its onset. Community-based programs should promote healthy lifestyle behavior early on in life, targeting children and adolescents to reduced the burden of diabetes in the Hispanic community. For individuals identified with diabetes, the goal of secondary prevention programs should be to prevent the serious complications of diabetes on the various organs, such as kidneys, blood vessels, and eyes. Secondary prevention often involves the screening of high-risk individuals. Essentially, it is the early detection and treatment of diabetes that will reduce the risk of severe complications. As already discussed, an appropriate screening test which is both simple and effective, has not been identified. Finally, the goal of tertiary prevention programs is to treat the complications of diabetes.

There is a need for increased education in the Hispanic community about the severity and the silent nature of diabetes. Many individuals in the Hispanic community are not aware of the potential consequences of uncontrolled diabetes. One way to increase diabetes education is to provide lay health educators, *promotores de salud* and other care givers in the Hispanic community with prevention strategies.

Lifestyle changes which minimize the risk of developing NIDDM should also be promoted at the national and community level. Both Latino and non-Latino media should be used to convey these messages. Influential community leaders should be involved in the promotion of public education efforts. A long-time commitment to a national initiative should be sought in order to achieve the behavioral changes required of diabetic individuals.

In addition to these prevention strategies targeted at individuals, strategies aimed at organizational change are also necessary. Health care has to be made more available to diabetic individuals. National diabetes care guidelines and standards should be developed and widely disseminated in order to facilitate the recognition and treatment of diabetes by health care providers. Often, providers do not mention the seriousness of diabetes and its complications prior to or early on in the disease.

The high financial and human costs for treatment of complications and disabilities, resulting from diabetes, are also an incentive for prevention and early detection programs. The costs are especially high considering productive years lost due to diabetes.

**The burden of diabetes for Latinos is aggravated by a number of factors, including language, socioeconomic status, beliefs and perceptions about health care, legal documentation status, and access to health insurance.** These and other factors increase the risk of diabetes and its complications. Language barriers include the lack of Spanish-speaking health care providers, information brochures in Spanish and other edu-

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cational materials, as well as the literacy levels of many Latinos. In 1994, less than half (49.4%) of the Latino population had attained a high school education level among persons 35 years and older.<sup>43</sup> As a result, not only are there English fluency problems for many Latinos but there are also literacy level problems. In general, a sixth grade reading level is often recommended for educational materials.

## X. Barriers to Health Care Services

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**Socioeconomic status is one of the most important factors creating barriers that prevent Latinos from obtaining adequate health care services.** Although Latinos represent a large percentage of the labor force, many are poor and in low-income brackets. While overall poverty rates declined in 1994, poverty rates for Hispanic families increased to the highest level ever recorded (27.8%) in that same year.<sup>44</sup> This relates to the issues of underemployment and the resulting lack of health insurance. Because many Latinos are in the lower income brackets, health insurance and preventive medicine may be out of reach. In addition to unaffordable health insurance, many employed Latinos do not qualify for Medicaid. Finally, many Latinos work in companies or organizations that do not provide health insurance or benefits package.

**Religious faith, educational attainment and acculturation play important roles in Latinos' attitudes about health care services.** How Latinos manage their health may differ according to groups of origin, age, gender, education, acculturation, socioeconomic status, culture and religious beliefs. Some Latinos may believe that nothing can be done about diabetes because of its hereditary nature. Others may prefer home-made remedies than to visit doctors or medical facilities for economic reasons. For some Latinos, religious faith and spirituality can play a role in the way they approach health. The belief that good health is a reward from God and that, likewise, poor health is a punishment for sin, can limit the numbers of diabetic Latinos that seek medical care.<sup>42</sup> In addition, strong religious beliefs, *Que sea lo que Dios quiera* (leave it up to God to cure me), may contribute to the indifferent attitudes to diabetes prevention at all levels.

There are additional factors that relate to minority issues, such as legal documentation of permanent residence. **Undocumented Latinos often have limited access to health care and treatment services.** They are less likely to seek available services for diabetes in fear of deportation. The attitudes and beliefs of Latino populations present barriers to diabetes education. In terms of diabetes management through diet, it is often difficult to convince the diabetic individual of the elevated risk associated with obesity. In many Hispanic subgroups, body image is unlike that of many Americans. A larger body size is often considered healthy, and thinness is often associated with illness.<sup>45</sup>

In terms of prevention efforts, it is important to consider the cultural barriers of various interventions. In the case of the Latino population, one must consider the influence of friends and family in the life of a Latino. Efforts should be placed on the family as a whole rather than on the individual.<sup>45</sup> For example, dietary changes should be apparent not only to the individual, but also to family members responsible for purchasing and preparing the meals in that household

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# National Resources on Diabetes

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**American Association of Diabetes Educators (AADE)**

444 N. Michigan Avenue, Suite 1240  
Chicago, IL 60611  
(312) 644-2233 or (800) 338-3633

**American Diabetes Association  
ADA National Service Center**

1660 Duke Street  
P.O. Box 25757  
Alexandria, VA 22313  
(703) 549-1500 or (800) 232-3472

**American Diabetic Association**

430 North Michigan Avenue  
Chicago, IL 60611  
(312) 822-0330

**National Diabetes Information  
Clearinghouse**

1 Information Way  
Bethesda, MD 20892-3560  
(301) 654-3327

**Centers for Disease Control  
and Prevention  
National Center for Chronic Disease  
Prevention and  
Health Promotion**

4770 Buford Highway  
Atlanta, GA 30341-3724  
(770) 488-5080

**Juvenile Diabetes Foundation**

432 Park Avenue, South  
New York, NY 10016-8013  
(212) 889-7575 or (800) 533-2873

**Health Promotion Council of  
Southeastern Pennsylvania, Inc.**

311 South Juniper Street, Suite 308  
Philadelphia, PA 19107-5803  
(215) 546-1276

**Programa Hispano Educativo Nacional  
Sobre Salud Del Ojo**

**National Eye Institute  
National Institutes of Health**

2020 Vision Place  
Bethesda, MD 20892-3655

**Diabetes Educational Resources for  
Minority and Low Literacy Populations  
American Diabetes Association,  
Michigan Affiliates, Inc.**

Clausen Building-North Unit, Suite 400  
23100 Providence Drive  
Southfield, MI 48075  
(313) 552-0480

**Health Promotion Council of SEPA, Inc.**

311 Juniper Street, Room 308  
Philadelphia, PA 19107  
(215) 546-1276

**The American Dietetic Association  
Diabetes Care and Education (DCE)  
Practice Group**

216 W. Jackson Boulevard, Suite 800  
Chicago, IL 60606-6995  
(312) 899-0400, Ext. 4813 or  
(800) 366-1655  
(Consumer Nutrition Hotline)

**Indian Health Service (IHS)**

IHS Headquarters West  
Central Diabetes Program  
5300 Homestead Road, N.E.  
Albuquerque, NM 87110  
(505) 837-4182

**International Diabetes Center (IDC)**

3800 Park Nicollet Boulevard  
Minneapolis, MN 55416  
(612) 993-3393



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**International Diabetes Federation (IDF)**

40 Rue Washington  
1050 Brussels, Belgium  
32-2/647-4414

**International Diabetic Athletes  
Association (IDAA)**

1647-B  
West Bethany Home Road  
Phoenix, AZ 85015  
(602) 433-2113

**Centers for Disease Control  
and Prevention**

Building Understanding to Prevent and  
control Diabetes Among Hispanics/  
Latinos: Selected Annotations  
Atlanta, GA

**Joslin Diabetes Center**

One Joslin Place  
Boston, MA 02215  
(617) 732-2400

**Office of Minority Health (OMH)  
Resource Center**

P.O. Box 37337  
Washington, D.C. 20013-7337  
(800) 444-6472

**Pennsylvania Diabetes Academy**

777 East Park Drive, Box 8820  
Harrisburg, PA 17105-8820  
(717) 558-7750, Ext. 271 or (800) 228-7823  
(AA Medical Society)



# NCLR Center for Health Promotion

The NCLR Center for Health Promotion serves as an umbrella that integrates and coordinates major health-related activities, and offers a broad menu of services such as: **capacity-building assistance** to Hispanic community-based organizations (CBOs) with guidance in such areas as fund-raising, resource development, Board/development, strategic planning, and program evaluation; facilitating with major health institutions through interactive networks; **information and resources**, developing and disseminating information guides, issue briefs/analyses, health education materials, and contacts for materials or information; researching and publishing Hispanic health statistics; and other **technical assistance and training**.

The NCLR Center for Health Promotion houses the following initiatives:

- ❖ The AIDS Center, established in 1988, carries out interrelated activities built around the concept of an interactive HIV/STD/TB network, including information sharing, development of program models, training, and capacity-building technical assistance.
- ❖ The Hispanic Health Liaison Project (HHLF), established in 1991, is designed to provide information, technical assistance, and support to Hispanic CBOs committed to increasing Hispanic involvement in preventive health efforts. HHLF focuses on breast and cervical cancer, diabetes, cardiovascular and respiratory diseases and other major health conditions affecting Hispanics, as well as increasing Hispanic access to health care.
- ❖ Maternal and Child Health Programs (MCH) focuses on combating the high rates of vaccine preventable diseases among Latinos and on training women to work as child health educators and advocates in their own communities.
- ❖ Other special projects such as a consultation on Hispanic disabilities, an analysis of Hispanic health insurance coverage, and seminars and workshops on substance abuse for health educators and managed care.

## Services Provided:

The NCLR Center for Health Promotion provides a wide variety of specialized trainings and technical assistance to Hispanic community-based organizations. Examples of available assistance include:

### Training Seminars:

- |  |                                   |
|--|-----------------------------------|
| ❖ Coalition building                         | ❖ Governance (Board of Directors) |
| ❖ Policy analysis                            | ❖ Program evaluation methods      |
| ❖ Resource development (fund-raising,        | ❖ Strategic planning              |
| public- and private-sector proposal writing) | ❖ Community needs assessment      |

### Technical Assistance:

- |                                    |  |
|------------------------------------|--|
| ❖ Computers/information management | ❖ Community needs assessments                                  |
| ❖ Fiscal management                | ❖ Liaison with health departments and mainstream organizations |
| ❖ Materials evaluation             | ❖ Program evaluation   |
| ❖ Personnel development            | ❖ Program planning/development                                 |
| ❖ Program models                   |  |

In addition, the Center prepares informational materials such as information briefs and "how to" guides to educate NCLR affiliates and other Hispanic community-based organizations about Hispanic health status and the potential for and importance of becoming involved in health education, prevention, advocacy/referral, and coalition activities.

